

Effect of six months of daily consumption of a multi-ingredient nutrition supplement containing fish oil, whey protein, vitamin D, and resveratrol on physical and cognitive function in older (>65 y) Irish adults

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Background

The etiology of sarcopenia is multi-factorial including the loss of muscle mass and muscle fibers, increased inflammation, altered hormonal profile, anabolic resistance, and inadequate nutrition intake. To date, pharmacological interventions have shown limited efficacy in counteracting the effects of sarcopenia, whereas most nutrition interventions focus on the provision of additional protein. However, a multi-ingredient nutrition strategy may offer additional therapeutic potential by targeting multiple factors associated with the development and consequences of sarcopenia including both physical and cognitive parameters.

Methods

A double-blind, placebo-controlled, randomized trial (ClinicalTrials.gov Identifier: NCT02001831) investigated the impact of a six month intervention with a bespoke multi-ingredient nutrition supplement (Smartfish® AS, Norway) on physical and cognitive function in pre-sarcopenic and sarcopenic older (>65 y) Irish adults. The supplement (SUPP) consisted of a 200 mL carton of juice-based drink each day (providing 200 kcal) that contained long chain n-3 polyunsaturated fatty acids (3000 mg: DHA 1500 mg and EPA 1500 mg), whey protein isolate (8 g), vitamin D3 (400 IU), and resveratrol (150 mg). The placebo (PLA) consisted of the fruit juice alone (200 kcal per day). Thirty-seven participants (age, 74.9±3.6 y) completed the six month intervention comprising of 16 in PLA (m=8, f=8), and 21 in SUPP (m=10, f=11). Body composition (DXA), physical function (short physical performance battery) and cognitive function (seven standardized measures) were assessed at baseline, 3 months and 6 months.

Results

Lean body mass was unchanged in either group after 6 months, but total body mass was increased in SUPP (71.4±16.3 vs. 72.2±16.0 kg, $p<0.01$), which was explained by a ~6% increase in fat mass ($p<0.01$). Correlation analyses revealed that despite the lack of effect of SUPP on LBM across the groups, a moderate inverse correlation ($r=-0.501$, $p<0.05$) exists between LBM at baseline and percentage of change in LBM at 6 months i.e. the lower that LBM was at baseline, the greater the effect of SUPP on increasing LBM. Handgrip strength decreased by 6.0% in PLA, but increased by 4.4% in SUPP ($p<0.01$). Tandem balance time was unchanged in PLA, but improved by 21% in SUPP ($p<0.05$). Chair rise time improved ($p<0.05$) to a similar extent (~10%) in both groups. No significant differences in cognitive performance were observed between groups after generation of composite scores grouped according to cognitive domains i.e. executive function, memory function, attention and sensorimotor speed, but performance in the Stroop Colour-Word task was improved ($p<0.05$) in SUPP.

Conclusion

Based on the preliminary data, we conclude that this bespoke multi-ingredient nutrition supplement demonstrates potential efficacy in elderly pre-sarcopenic and sarcopenic individuals, particularly in those exhibiting lowest muscle mass prior to intervention, whereas the effects on handgrip and balance are indicative of beneficial effects independent of change in LBM. Remaining analyses will include analysis of blood markers of metabolic health and neuromuscular function, and comparison of gender-specific responses.